

WHAT IS CLAIMED IS:

1. A method of typing a variable region of a specific variant of an antigen receptor chain, the method comprising:

- (a) exposing a probe set to a sense or antisense strand of a polynucleotide encoding at least a portion of the variable region of the specific variant of the antigen receptor chain, wherein said probe set includes a plurality of probe molecules, wherein each probe molecule of said plurality of probe molecules is substantially complementary to a sense or antisense strand of a nucleic acid sequence region of a specific polynucleotide encoding a variant of the antigen receptor chain, said nucleic acid sequence region distinctly encoding a specific combination of at least two variable region segments of the antigen receptor chain; and
- (b) measuring a hybridization of each probe molecule of said plurality of probe molecules with said sense or antisense strand of said nucleic acid sequence region of said polynucleotide encoding at least a portion of the variable region of the specific variant of the antigen receptor chain, thereby typing the variable region of the specific variant of the antigen receptor chain.

2. The method of claim 1, wherein each probe molecule of said probe set is attached to a probe array at a specific addressable location of a plurality of addressable locations included in said probe array.

3. The method of claim 2, wherein said probe array includes said plurality of addressable locations at a surface density of at least 625 specific addressable locations per square centimeter of a support comprised in said probe array.

4. The method of claim 1, wherein step (b) is effected by measuring a collective hybridization of said sense or antisense strand of said polynucleotide encoding at least said portion of the variable region of the specific variant of the antigen receptor chain, with each distinct probe molecule of each distinct subset of

probe molecules of a group of distinct subsets of probe molecules of said probe set, wherein said group of distinct subsets of probe molecules includes a number of distinct subsets of probe molecules selected from a range of 1-299 distinct subsets of probe molecules.

5. The method of claim 4, wherein each distinct subset of probe molecules of said group of distinct subsets of probe molecules includes a number of distinct probe molecules selected from a range of 1-128 distinct probe molecules.

6. The method of claim 4, wherein each distinct subset of probe molecules of said group of distinct subsets of probe molecules is attached to a probe array at a specific addressable location of a plurality of addressable locations included in said probe array.

7. The method of claim 6, wherein said probe array includes said plurality of addressable locations at a surface density of at least 625 specific addressable locations per square centimeter of a support comprised in said probe array.

8. The method of claim 1, wherein the polynucleotide encoding at least said portion of the variable region of the specific variant of the antigen receptor chain is a complementary DNA molecule.

9. The method of claim 1, wherein said probe set includes a number of probe molecules selected from the group consisting of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 or 25 probe molecules.

10. The method of claim 1, wherein said probe set includes a number of probe molecules selected from a range of 26-30, 31-35, 36-40, 41-45, 46-50, 51-55, 56-60, 61-65, 66-70, 71-75, 76-80, 81-85, 86-90, 91-95, 96-100, 101-150, 151-200, 201-250, 251-300, 301-350, 351-400, 401-450, 451-500, 501-550, 551-600, 601-650, 651-700, 701-750, 751-800, 801-850, 851-900, 901-950, 951-1,000, 1,001-1,100, 1,101-1,200, 1,201-1,300, 1,301-1,400, 1,401-1,500, 1,501-1,600, 1,601-1,700, 1,701-1,800, 1,801-1,900, 1,901-2,000, 2,001-2,100, 2,101-2,200, 2,201-2,300, 2,301-2,400,

2,401-2,500, 2,501-2,600, 2,601-2,700, 2,701-2,800, 2,801-2,900, 2,901-3,000, 3,001-3,500, 3,501-4,000, 4,001-4,500, 4,501-5,000, 5,001-5,500, 5,501-6,000, 6,001-6,500, 6,501-7,000, 7,001-7,500, 7,501-8,000, 8,001-8,500, 8,501-9,000, 9,001-9,500 or 9,501-9,776 probe molecules.

11. The method of claim 1, wherein said at least two variable region segments are selected from the group consisting of a V-segment, a D-segment and a J-segment.

12. The method of claim 11, wherein said V-segment has a third complementarity determining region specific portion which has an amino acid sequence selected from the group consisting of SEQ ID NOs: 1-23, and whereas each probe molecule of said probe set is substantially complementary to at least a portion of said sense or antisense strand of said nucleic acid sequence region of said specific polynucleotide wherein said portion of said sense or antisense strand encodes said third complementarity determining region specific portion of said V-segment.

13. The method of claim 1, wherein each probe molecule of said probe set is a single stranded polynucleotide composed of a number of nucleotides selected from a range of 24-48 nucleotides.

14. The method of claim 13, wherein said single stranded polynucleotide is a single stranded DNA molecule.

15. The method of claim 13, wherein said single stranded polynucleotide includes at least one nucleic acid sequence selected from the group consisting of SEQ ID NOs: 24-60 and antisense sequences thereof.

16. The method of claim 1, wherein the antigen receptor chain is a T-cell receptor chain.

17. The method of claim 16, wherein said T-cell receptor chain is T-cell receptor beta.

18. The method of claim 1, wherein the antigen receptor chain is a human antigen receptor chain.

19. A probe array comprising a support including a plurality of addressable locations and a probe set including a plurality of probe molecules, wherein each probe molecule of said plurality of probe molecules is attached to a specific addressable location of said plurality of addressable locations of said support, and is substantially complementary to a sense or antisense strand of a nucleic acid sequence region of a specific polynucleotide encoding a variant of an antigen receptor chain, said nucleic acid sequence region distinctly encoding a specific combination of at least two variable region segments of said antigen receptor chain.

20. The probe array of claim 19 wherein each distinct subset of a group of distinct subsets of distinct probe molecules of said probe set is attached to said probe array at a specific addressable location of said plurality of addressable locations, and includes a number of distinct probe molecules selected from a range of 1-128 distinct probe molecules.

21. The probe array of claim 19, wherein said probe array includes said plurality of addressable locations at a surface density of at least 625 specific addressable locations per square centimeter of said support.

22. The probe array of claim 19, wherein said probe set includes a number of probe molecules selected from the group consisting of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 or 25 probe molecules.

23. The probe array of claim 19, wherein said probe set includes a number of probe molecules selected from a range of 26-30, 31-35, 36-40, 41-45, 46-50, 51-55, 56-60, 61-65, 66-70, 71-75, 76-80, 81-85, 86-90, 91-95, 96-100, 101-150, 151-200, 201-250, 251-300, 301-350, 351-400, 401-450, 451-500, 501-550, 551-600, 601-650, 651-700, 701-750, 751-800, 801-850, 851-900, 901-950, 951-1,000, 1,001-1,100, 1,101-1,200, 1,201-1,300, 1,301-1,400, 1,401-1,500, 1,501-1,600, 1,601-1,700, 1,701-1,800, 1,801-1,900, 1,901-2,000, 2,001-2,100, 2,101-2,200, 2,201-2,300, 2,301-2,400,

2,401-2,500, 2,501-2,600, 2,601-2,700, 2,701-2,800, 2,801-2,900, 2,901-3,000, 3,001-3,500, 3,501-4,000, 4,001-4,500, 4,501-5,000, 5,001-5,500, 5,501-6,000, 6,001-6,500, 6,501-7,000, 7,001-7,500, 7,501-8,000, 8,001-8,500, 8,501-9,000, 9,001-9,500 or 9,501-9,776 probe molecules.

24. The probe array of claim 19, wherein said at least two variable region segments are selected from the group consisting of a V-segment, a D-segment and a J-segment.

25. The probe array of claim 24, wherein said V-segment has a third complementarity determining region specific portion which has an amino acid sequence selected from the group consisting of SEQ ID NOs: 1-23, and whereas each probe molecule of said probe set is substantially complementary to at least a portion of said sense or antisense strand of said nucleic acid sequence region of said specific polynucleotide, wherein said portion of said sense or antisense strand encodes said third complementarity determining region specific portion of said V-segment.

26. The probe array of claim 19, wherein each probe molecule of said probe set is a single stranded polynucleotide composed of a number of nucleotides selected from a range of 24-48 nucleotides.

27. The probe array of claim 26, wherein said single stranded polynucleotide is a single stranded DNA molecule.

28. The probe array of claim 26, wherein said single stranded polynucleotide includes at least one nucleic acid sequence selected from the group consisting of SEQ ID NOs: 24-60 and antisense sequences thereof.

29. The probe array of claim 19, wherein said antigen receptor chain is a T-cell receptor chain.

30. The probe array of claim 29, wherein said T-cell receptor chain is T-cell receptor beta.

31. The probe array of claim 19, wherein said antigen receptor chain is a human antigen receptor chain.

32. A probe set comprising a plurality of probe molecules, each probe molecule of said plurality of probe molecules being substantially complementary to a sense or antisense strand of a nucleic acid sequence region of a specific polynucleotide encoding a variant of an antigen receptor chain, said nucleic acid sequence region distinctly encoding a specific combination of at least two variable region segments of said antigen receptor chain.

33. The probe set of claim 32, wherein the probe set includes a number of probe molecules selected from the group consisting of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 or 25 probe molecules.

34. The probe set of claim 32, wherein the probe set includes a number of probe molecules selected from a range of 26-30, 31-35, 36-40, 41-45, 46-50, 51-55, 56-60, 61-65, 66-70, 71-75, 76-80, 81-85, 86-90, 91-95, 96-100, 101-150, 151-200, 201-250, 251-300, 301-350, 351-400, 401-450, 451-500, 501-550, 551-600, 601-650, 651-700, 701-750, 751-800, 801-850, 851-900, 901-950, 951-1,000, 1,001-1,100, 1,101-1,200, 1,201-1,300, 1,301-1,400, 1,401-1,500, 1,501-1,600, 1,601-1,700, 1,701-1,800, 1,801-1,900, 1,901-2,000, 2,001-2,100, 2,101-2,200, 2,201-2,300, 2,301-2,400, 2,401-2,500, 2,501-2,600, 2,601-2,700, 2,701-2,800, 2,801-2,900, 2,901-3,000, 3,001-3,500, 3,501-4,000, 4,001-4,500, 4,501-5,000, 5,001-5,500, 5,501-6,000, 6,001-6,500, 6,501-7,000, 7,001-7,500, 7,501-8,000, 8,001-8,500, 8,501-9,000, 9,001-9,500 or 9,501-9,776 probe molecules.

35. The probe set of claim 32, wherein said at least two variable region segments are selected from the group consisting of a V-segment, a D-segment and a J-segment.

36. The probe set of claim 35, wherein said V-segment has a third complementarity determining region specific portion which has an amino acid sequence selected from the group consisting of SEQ ID NOs: 1-23, and whereas each

probe molecule of said probe set is substantially complementary to at least a portion of said sense or antisense strand of said nucleic acid sequence region of said specific polynucleotide wherein said portion of said sense or antisense strand encodes said third complementarity determining region specific portion of said V-segment.

37. The probe set of claim 32, wherein each probe molecule of said probe set is a single stranded polynucleotide composed of a number of nucleotides selected from a range of 24-48 nucleotides.

38. The probe set of claim 37, wherein said single stranded polynucleotide is a single stranded DNA molecule.

39. The probe set of claim 37, wherein said single stranded polynucleotide includes at least one nucleic acid sequence selected from the group consisting of SEQ ID NOs: 24-60 and antisense sequences thereof.

40. The probe set of claim 32, wherein said antigen receptor chain is a T-cell receptor chain.

41. The probe set of claim 40, wherein said T-cell receptor chain is T-cell receptor beta.

42. The probe set of claim 32, wherein said antigen receptor chain is a human antigen receptor chain.